Project Narrative

Farming for the Future: Empowering Pennsylvania Farmers to Build Resilient and Sustainable Agricultural Systems in Response to a Changing Climate"

Submitted to the EPA Environmental Justice Small Grants Program
by the Pennsylvania Association for Sustainable Agriculture
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I. Project Title and Project Purpose Statement

The Pennsylvania Association for Sustainable Agriculture's (PASA's) project, "**Farming for the Future: Empowering Pennsylvania Farmers to Build Resilient and Sustainable Agricultural Systems in Response to a Changing Climate**" will increase Pennsylvania farmers' knowledge of what climate change is and how climate change impacts farms both ecologically and economically. The project will empower farmers to adapt to changing climate conditions through sustainable agricultural methods including building soil and enhancing biodiversity on their farms. By bringing farmers, extension educators, researchers, and private and land grant universities together to learn and share with one another, the project will foster a community-based learning and innovation network to guide future work supporting climate change resiliency in the Pennsylvania agricultural community. PASA will host two on-farm Field Days, one Pre-Conference Track at the 2016 *Farming for the Future Conference*, and one webinar. At least 100 farmers in Pennsylvania will attend educational workshops and increase their understanding of climate change and sustainable agricultural methods that can build farm resiliency. At least 6,000 farmers and sustainable agriculture community members will increase their understanding of climate change and its impacts on food and farming, as well as adaptive strategies through a four-part newsletter series in PASA's bi-monthly publication *Passages*. Through a Project Planning Committee and culminating Climate Change and Agriculture Round Table Meeting, a community-based learning and innovation network including farmers, agricultural organizations, Penn State Extension, and university students and researchers will be formed to advise project development and set new goals for future collaborative work. This project will be managed from PASA's Western Region Office (Richland Township, PA 15044), in collaboration with Penn State Extension Allegheny County (Pittsburgh, PA 15208) and take place throughout the Commonwealth of Pennsylvania, with Field Days and Round Table Meeting being hosted on farms in the western region of the state, a Pre-Conference Track hosted in State College, PA 16803, and newsletter series and webinar made available to farmers throughout the state. The project relates to the federal Clean Water Act, Section 104(b) (3) by training farmers in sustainable agriculture methods which reduce and prevent agriculturally related water pollution. This project has a specific focus on community climate resiliency.

II. Environmental, Public Health and Community Climate Resiliency: Information About the Affected Community

The Pennsylvania Association for Sustainable Agriculture's (PASA's) project, "**Farming for the Future: Empowering Pennsylvania Farmers to Build Resilient Sustainable and Agricultural Systems in Response to a Changing Climate**" provides information and education to help Pennsylvania farmers understand and adapt to the environmental impacts of climate change. In addition, the project fosters a network of farmers and practitioners to build

capacity for learning and longer-term organizing around agricultural adaptation to our changing climate.

According to the Union of Concerned Scientists report 2008 report "Climate Change in Pennsylvania: Impacts and Solutions for the Keystone State," Pennsylvania retains one of the largest rural populations in the United States, and the state is home to at least 59,000 farms, many of them small and family run. Agriculture is not only essential to the state's economy, but small family farmers are also the cornerstone of rural Pennsylvania communities, key stewards of our land and natural resources, and the source of essential healthy local food for all people. Yet, while some new initiatives are beginning to take shape at universities, and through the newly located USDA Climate Hub office at Penn State University, currently, there is very limited information for Pennsylvania farmers who want to learn about and adapt to climate change.

This project focuses on PASA member farmers, and other family farmers in Pennsylvania who want to learn about sustainable farming practices as an adaptation to climate change. PASA represents a diversity of Pennsylvania farmers. According to our 2010 comprehensive membership survey, the average age of a PASA farmer is 48 years old, a bit younger than the statewide average of 55.2. PASA farmers include both new and established farmers. Forty three percent of PASA members represented by the survey characterized themselves as either aspiring or beginning farmers, and the average operation size is 112 acres, slightly smaller than the state average of 124 acres. PASA's farmers use a range of sustainable production methods; 63% use low or no spray techniques, 56% use organic practices, and 58% are preserving biodiversity by growing heirloom varieties. PASA farmers are also diverse in terms of the types of operations they run and the products they produce, including vegetable crops, fruit crops, poultry, meat animals, and value-added products.

Farmers are disproportionately dependent on the environment for their livelihood and well-being than those in most other occupations. The best and most successful farmers work in concert with natural systems. They are adept at adapting to changing weather patterns, and committed to raising food while stewarding the air, soil, and water upon which they depend. However, farmers face greater uncertainty and risk as the pace and scope of climate change creates more extreme and unpredictable fluctuations in environmental conditions. The Union of Concerned Scientists reports that "Global warming is already making a mark on the landscape, livelihoods, and traditions of Pennsylvania, and over the coming decades, the impacts are expected to grow more substantial across the state." Over the past 100 years, annual average temperatures have increased by .5 degrees Fahrenheit in Pennsylvania, with winters warming the most, while the number of summer days over 90 degrees Fahrenheit has been increasing since 1970.

As a result of global warming, Pennsylvania farmers will face longer and more intense summer heat waves, northward shifts in zones for plant and animal species, and more unpredictable and extreme weather events. Even now, PASA farmers reported in our membership survey that the most significant barrier to the success of their operations (after not having enough time) was inclement weather. As weather patterns continue to change, and become more extreme, farmers face new challenges to keep their livestock cool and manage summer heat stress and increased pest and disease outbreaks in field and orchard crops. These challenges threaten yields and the economic viability of small family farms, putting farmers' livelihoods at risk.

In the article, "Climate Change and Perennial Fruit and Nut Production: Investing in Resilience in Uncertain Times," the National Center for Appropriate Technology (NCAT) identifies strategies for farmers to adapt to the challenges of climate change, including diversification, soil building, and technology and information. By empowering farmers with information about climate change and sustainable agricultural skills such as soil building and increasing biodiversity on their farms, Pennsylvania farmers can build resilient agricultural systems that are diverse and flexible, and able to sustain ecologically and economically in the face of dramatic changes in our climate. PASA will host two on-farm Field Days, one Pre-Conference Track at the 2016 *Farming for the Future Conference*, and one webinar. At least 100 farmers in Pennsylvania will attend educational workshops and increase their understanding of climate change and sustainable agricultural methods that can build farm resiliency. 75% of these farmers will indicate that they will apply new sustainable agriculture methods to mitigate climate change risks on their farms. At least 6,000 farmers and sustainable agriculture community members will increase their understanding of climate change and its impacts on food and farming, as well as adaptive strategies through a four-part newsletter series in PASA's bi-monthly publication *Passages*. Through a Project Planning Committee and culminating Climate Change and Agriculture Round Table Meeting, a community-based learning and innovation network including farmers, agricultural organizations, Penn State Extension, and university students and researchers will be formed to advise, monitor, and evaluate the project, and based on lessons learned, set an agenda together for future collaborative research, education, and outreach to address Pennsylvania farmers' needs in the face of climate change.

III. <u>Organization's Historical Connection to the Affected Community</u>

The Pennsylvania Association for Sustainable Agriculture's consistent vision has been to transform agriculture and food systems in Pennsylvania and beyond in a way that makes farmers more viable, improves the land, and restores the health and well-being of all our citizens. The mission of PASA is to *promote profitable farms that produce healthy food for all people, while respecting the natural environment.*

PASA was formed by a group of farmers, extension agents, and leaders of environmental organizations who wanted to provide farmers with more opportunities to learn sustainable farming techniques. Since 1992, PASA has been working to bring farmers together to learn from each other, and to build relationships between those farmers and consumers looking for fresh, sustainably produced food. As the largest statewide, member-based sustainable farming organization in the United States, we seek to improve the economic viability, environmental soundness, and social responsibility of food and farming systems in Pennsylvania and across the country. PASA is a membership-based organization, and farmers are central to organizational and programmatic decision making processes. The majority of our 6,000 members are family farmers, and we maintain and sustain a direct relationship with them through communications including e-newsletters and dynamic regional listservs, our bi-monthly print newsletter *Passages*, and a robust menu of programming including Field Days, our flagship *Farming for the Future Conference*, and networking events and potluck gatherings. Our Board of Directors is also led by farmers, and we have four Regional Advisory Committees throughout the state made up of farmer members who help to shape our work and programming. This project will be supported by a Project Planning Committee including farmers and organizational partners to help identify farmer presenters and workshop hosts and advise project planning, outreach and identify next steps and needs to carry this work forward beyond this grant project.

PASA has worked for over 20 years to help farmers address local environmental issues providing educational opportunities for farmers to learn sustainable agriculture practices from experts in the field, and from one another. Each year over 2,000 people come together for our *Farming for the Future* Conference, one of the largest and most respected gatherings on this topic in the U.S. The conference is followed by a full season of Farm-Based Education events, including Field Days, Intensive Learning Programs, and regional workshops and programs that deliver practical information on sustainable farming methods using a farmer-to-farmer teaching model.

This project will be PASA's first effort to focus specifically on the impacts of climate change on our farming community, and will pave the way for more of this work in the future, as well as new collaborations with project partners including Penn State Extension, Northeast Regional Hub for Risk Adaptation and Mitigation to Climate Change and Chatham University.

Leah Smith, the Project Manager for the proposed "**Farming for the Future: Empowering Pennsylvania Farmers to Build Resilient and Sustainable Agricultural Systems in Response to a Changing Climate**" is the Western Region Director for PASA, and has worked for PASA's Western Regional Office for over five years. She began working for PASA in 2009, upon the completion of a Master of Science in Rural Sociology from Ohio State University. Over the past five years, Leah Smith has worked to build a strong community of farmers in Western Pennsylvania, and develop programs in response to farmers' educational needs in the region.

IV. Project Description

The goals of the Pennsylvania Association for Sustainable Agriculture's (PASA's) one-year project (June 2015-June 2016), "**Farming for the Future: Empowering Pennsylvania Farmers to Build Resilient and Sustainable Agricultural Systems in Response to a Changing Climate**" are to 1.) Increase Pennsylvania farmers' understanding of what climate change in and how climate change impacts farms both ecologically and economically 2.) Empower farmers to adapt to changing climate conditions through sustainable agricultural methods including building soil and enhancing biodiversity on their farms and 3.) Foster a community-based learning and innovation network to build climate change resiliency in the Pennsylvania agricultural community and support continued research and education on this issue beyond the scope of this grant project. This project relates to the **Federal Clean Water Act, Section 104(b) (3)** by training farmers in sustainable agriculture methods including soil building, enhancing crop and landscape biodiversity, and managing orchards organically, which reduce and prevent agriculturally related water pollution.

To educate and empower Pennsylvania's agricultural community around issues of climate change and agricultural adaptation strategies, PASA, in collaboration with Penn State Extension, will work with partners including the Northeast Regional Hub for Risk Adaptation and Mitigation to Climate Change, Chatham University, and local Pennsylvania farmers to host two on-farm Field Days, one webinar, one Pre-Conference Track at the 2016 *Farming for the Future Conference*, and a newsletter article series to provide education to farmers about climate change impacts in Pennsylvania, and empower them with sustainable farming methods to build soil and promote biodiversity in order to foster resilient agricultural systems. A Project Planning Committee and Climate Change and Agriculture Round Table will provide guidance for the project and create an engaged and collaborative learning network with the goal to identify future work to continue to learn from and support farmers as they adapt to a changing climate.

As a result of this project, at least 100 farmers in Pennsylvania will attend educational workshops and increase their understanding of climate change and sustainable agricultural methods that can build farm resiliency. 75% of these farmers will indicate that they will apply new sustainable agriculture methods to mitigate climate change risks on their farms. At least 6,000 farmers and sustainable agriculture community members will increase their understanding of climate change and its impacts on food and farming, as well as adaptive strategies through a four-part newsletter series in PASA's bi-monthly publication *Passages*. As a result of the Project Planning Committee and culminating Climate Change and Agriculture Round Table Meeting, a community-based learning and innovation network including farmers, agricultural organizations, Penn State Extension, and university students and researchers will, based on lesson learned, set an agenda together for future collaborative research, education, and outreach, increasing the community's capacity to continue to address Pennsylvania farmers' climate resiliency needs.

Climate Change and Sustainable Agriculture Field Days
PASA will host two on-farm workshops in Western Pennsylvania that include a series of presentations covering the impacts of climate change on agriculture and solutions to climate-related issues that are relevant to the region, as well as a farm tour modeling some of the practices discussed. The workshops will be tailored to the issues and opportunities specific to the region where they take place, and will be presented by academic researchers, agricultural professionals and producers. Workshops will take place in Fall 2015 and Spring 2016, with one focusing on the topic of "Climate Change and Soil Building," and the other focusing on "Climate Change and Biodiversity." The Project Planning Committee will assist the Project Manager in identifying host farms demonstrating sustainable agriculture practices that promote climate change resiliency. Presenters will Michael H. Finewood, Ph.D., Assistant Professor of Geography and Sustainability with the Falk School of Sustainability of Chatham University, Lee Stivers, Extension Education with Penn State Extension, and a researcher/scientists from the Northeast Regional Hub for Risk Adaptation and Mitigation to Climate Change, as well as local farmers with expertise in soil building and on-farm biodiversity.

Climate Change and Sustainable Agriculture Webinar
PASA and Penn State Extension will collaborate to host one webinar in the Winter of 2015 focused on specific issues relevant to Pennsylvania fruit growers. Extension specialists from the Penn State Extension Fruit Research and Extension Center will help farmers managing fruit orchards understand the specific implications of climate change to orchard crops, and ways to adapt and mitigate risk to fruit crops through new agricultural technologies to mitigate heat stress, and increasing and selecting for varietal diversity.

Climate Change and Sustainable Agriculture Pre-Conference Workshop Track
The *Farming for the Future Conference* is PASA's flagship event hosted annually at the Penn Stater Conference Center in State College, Pennsylvania will be entering its 25th year in February 2016. The theme for the conference will focus on agriculture and climate change, and a special pre-conference workshop track will allow farmers the opportunity to explore and learn about this topic in depth, with a focus on understanding what climate change is and how it impacts farming systems ecologically and agricultural businesses economically, as well as innovative adaptations climate conditions through sustainable agricultural methods including building soil and enhancing biodiversity on their farms. Presenters will include researchers from Chatham University, Penn State University and Penn State Extension, including Charlie White, Sustainable Agriculture Extension Associate, and scientists from the Northeast Regional Hub for

Risk Adaptation and Mitigation to Climate Change. The Project Planning Committee will assist and advise in the development of this track, and recording of the track will be archived as a resource for farmers unable to attend in person.

Climate Change and Sustainable Agriculture Newsletter Article Series
In order to provide education and build farmers' awareness of climate change and its impacts on agriculture, PASA will coordinate a series of four newsletter articles in our bi-monthly newsletter *Passages*, and made available to our over 6,000 subscribers, in addition to the general public online and through copies distributed at outreach events. Newsletter articles will focus on helping farmers understand what climate change is, and how sustainable agriculture methods can mitigate risks for farmers associated with a changing climate. Charlie White, Sustainable Agriculture Extension Associate for Penn State Extension, Michael Finewood, Ph.D., Assistant Professor of Geography and Sustainability with the Falk School of Sustainability of Chatham University, the Northeast Regional Hub for Risk Adaptation and Mitigation to Climate Change, and Heather Mikulas, Penn State Extension Associate, Allegheny County, have committed to contributing articles to this series based on their research and experience in the field of climate and agriculture.

Climate Change and Agriculture Round Table Meeting
In collaboration with Chatham University's Falk School of Sustainability and Penn State Extension, PASA will host a Climate Change Round Table which will convene a community-based learning and innovation network including farmers, agricultural organizations, Penn State Extension, and university students and researchers and include presentations on climate change and agricultural impacts, innovations agricultural adaptations to climate change, and break-out sessions to continue to explore farmers perspectives on the impacts of climate change, best practices and strategies for adaptation. This culminating meeting will help to shape the Project Planning Committee's goals for future work beyond the scope of this grant, including climate change and agriculture research, education, and outreach needs for farmers in western Pennsylvania.

Project Evaluation
In order to evaluate the success of the project, paper and online evaluations will be conducted of farmer participants to gauge whether they have increased their understanding of climate change in Pennsylvania and its impacts on agriculture, what they have learned and how they plan to implement adaptive strategies on their farms, and what other needs they can identify related to farming in the face of climate change. In addition, the Project Planning Committee will convene quarterly to track the project milestones as outlined in the timeline, and review and advise program attendance, outreach strategies, and program development to keep the project moving forward and achieving expected outputs and outcomes. At the culmination of the year-long project, the will develop a set of recommendations for future work in Western Pennsylvania, based on the evaluation feedback from farmer participants collected through evaluations and at the Climate Change and Agriculture Round Table.

Roles and Responsibilities of Key Organizations
The Pennsylvania Association for Sustainable Agriculture will manage this project from PASA's Western Region Office, and work in close partnership with Penn State University Extension, Chatham University, and the Northeast Regional Hub for Risk Adaptation and Mitigation to Climate Change to provide education to our farmers. This project represents the first climate

change related education and outreach offered for farmers in Western Pennsylvania and at the *Farming for the Future Conference*. By including these partners in a Project Planning Committee and by building strong partnerships now, we lay the foundation for effective and sustained work into the future as we learn and develop the project together. PASA and the project partners share common goals around initiating an awareness of dialogue about climate change in the agricultural community, and using this project as an opportunity to increase our understanding of farmers perceptions of climate change, their best practices to adapt in the field, and the additional education and research needs that we can continue to address beyond the scope of this initial project.

Project Partners

Penn State University Extension: Represented by Heather Mikulas, Extension Educator, Allegheny County, Penn State Extension will support this project by participating in the Project Planning Committee , coordinating extension educators to contribute educational content in Field Days, pre-conference track, and newsletter series, promoting events and cross-publishing newsletter articles, and taking a leadership role in developing the webinar on climate change and adaptation strategies for fruit growers by coordinating with the Penn State Extension Fruit Research and Extension Center and marketing through the Apple Marketing Board. Penn State Extension is especially interested in learning about and sharing adaptive strategies with farmers related to the business risks and impacts climate change imposes on farmers, and also offering technical expertise on topics related to biodiversity and soil building as elements of resilient agricultural systems. Extension brings technical knowledge, connections with research and researchers on climate change and climate modeling (including Charlie White, Sustainable Agriculture Extension Associate), and promotion and outreach assistance to this project.

Chatham University Falk School of Sustainability: Represented by Michael Finewood, Ph.D., Assistant Professor of Geography and Sustainability with the Falk School of Sustainability of Chatham University, has worked with students to do some preliminary research on farmers' perceptions of and adaptations to climate change in western Pennsylvania, and is interested in expanding this work in collaboration with PASA. The University brings expertise and knowledge of local conditions in western Pennsylvania, and an understanding of how to frame these issues to resonate with farmers in a region where the term "climate change" can still be politically charged. Chatham University will support this project by participating in the Project Planning Committee, coordinating extension educators to contribute educational content in Field Days, pre-conference track, and newsletter series, promoting events and cross-publishing newsletter articles, and co-hosting the Climate Change and Agriculture Round Table. Chatham is especially committed to continuing this partnership beyond the scope of this grant, and use this project to identify the additional research and education needs of farmers related to climate change issues.

Northeast Regional Hub for Risk Adaptation and Mitigation to Climate Change: Represented by Dan Tobin, Postdoctoral Fellow, this newly established hub based at Penn State University is seeking to make more connections with farmers to ground and apply their research. Formed to address increasing climate and weather-related risks to agriculture, such as devastating floods, crippling droughts, extreme storms, fires and invasive pests the Northeast Climate Hub is a partnership among the Forest Service, Agricultural Research Service, Natural Resources Conservation Service, and other federal, state and private organizations. The Hub is conducting research and establishing educational priorities in the next year, and will provide connections

with scientists to provide education to farmers on climate change at workshops and the pre-conference track, as well as contributing to the newsletter series and participating in the Climate Change and Agriculture Round Table.

Project Timeline

Timeframe	**Activity**
Quarterly- June 2015, September 2015, December 2015, March 2016	Project Planning Committee meets via conference call to develop, monitor, and evaluate programs
Quarterly- July 2015, October 2015, January 2016, May 2016	*Passages* Newsletter Climate Change Article Series
Fall 2015	On Farm Field Day- Soil Building
Winter 2015	Webinar- Climate Change and Orchard Production
Winter, February 2016	PASA *Farming for the Future* Conference Pre-Conference Climate Change Track
Spring 2016	On Farm Field Day- Biodiversity
Summer 2016	Climate Change and Agriculture Round Table

V. Organizational Capacity and Programmatic Capability

The Pennsylvania Association for Sustainable Agriculture is accustomed to managing, expending, and accounting for federal funds, and has a full time bookkeeper, as well as a part time accountant on staff, in addition to a full time Administrative Director to oversee accounting and organizational systems, using the accounting software *Abila*. Leah Smith, the Western Region Director will serve as project manager for this grant, and will oversee the activities of the grant with support from PASA staff including Western Region Program Coordinator and Conference Manager, organizational partners, and Project Planning Committee (committee will have quarterly conference calls). She will also work with accounting to track and monitor grant finances and develop and submit timely reports.

PASA has successfully managed federally funded grant projects in the past, expending funds as outlined in proposals, submitting project and financial reports. We have documented progress toward achieving expected outputs and outcomes as outlined in logic models through monthly and quarterly reports, and we closely monitor and track grant expenditures through our professional accounting systems which include accounting codes specific to grant projects. Over the past three years we have successfully completed two federally funded grants, listed below. In the case of the Farmers Market Promotion Program project, we did have to adjust our plan of work over the course of the project due to unanticipated circumstances. We worked with our program officer to develop a revised budget and reallocate funds to support other aspects of the project. We do have documentation and reports outlining this procedure, and a final report at the close of the project.

Project Name: "Transitions to Reduced Risk Pest Management"
Grant: EPA#8-97392901-0
Date: 9/1/2010-8/31/2012

Amount: $52,640
Project Officer: John Butler

Project Name: Making Markets Thrive-Broadening the Reach of Buy Fresh Buy Local in Pennsylvania"
Grant: USDA Farmers Market Promotion Program #12-25-G-1627
Date: 10/1/2012-6/30/2014
Amount: $89,546
Project Officer: Carmen Humphrey

VI. Qualifications of the Project Manager

The project manager, Leah Smith, is the Western Region Director for the Pennsylvania Association for Sustainable Agriculture. Smith has a Master of Science Degree in Rural Sociology from the Ohio State University, and has worked in the field of non-profit management and agriculture for over 9 years. Smith has worked for PASA since 2009, and over the past five years, PASA membership in the 19 counties of Western Pennsylvania has grown by 30% under Smith's leadership, a result of the strong educational programs and direct service to farmers Smith's office provides. She has developed a series of workshops for beginning and aspiring farmers, funded by the local Laurel Foundation, a four part series of workshops in 4 counties to help farmers understand the environmental impacts of Marcellus Shale natural gas production with funding from the Colcom Foundation, and most recently completed a project working with farmers in Allegheny County to learn about and demonstrate no-till vegetable production strategies to reduce agricultural run-off and water pollution.

VII. Past Performance in Reporting on Outputs and Outcomes

Leah Smith, the Project Manager, has worked on numerous grants, both Federal and non-Federal, to support the work she does with farmers in Western Pennsylvania. She developed the logic model for the USDA Farmers Market Promotion Program Grant and assisted in writing the final report for that large federally funded project, including conducting evaluations to determine achievement of expected outcomes and outputs. In order to prepare interim and final reports for other grant funded projects, including the two additional projects related to farmer education and environmental education for the agricultural community listed below, she managed tracking grant activities and conducted and analyzed evaluations from project participants.

Project Name: Making Markets Thrive-Broadening the Reach of Buy Fresh Buy Local in Pennsylvania"
Grant: USDA Farmers Market Promotion Program #12-25-G-1627
Date: 10/1/2012-6/30/2014
Amount: $89,546
Project Officer: Carmen Humphrey
Role: Supervised western region Buy Fresh Buy Local Coordinator who conducted grant activities, Assisted with Final Reporting

Project Name: Strengthening the Agricultural Workforce and Local Food System Economy in Southwest Pennsylvania through Education and Network Development
Grant: Mary Hillman Jennings Foundation
Date: 5/1/2011-4/30/2012

Amount: $20,000
Project Officer: Lauri Fink
Role: Project manager, conducted all grant activities and reporting

Project Name: Marcellus Shale Choices: Information to Action
Grant: Colcom Foundation: Marcellus Environmental Fund
Date: 3/1/2011-3/1/2012
Project Officer: Carol Zagrocki
Role: Project manager, conducted all grant activities and reporting

VIII. Quality Assurance Project Plan (QAPP) Information

This project will not involve the use of existing environmental data or the collection of new data, although we will invite researchers and extension educators to share information and facts about climate change in the region, this project is educational, and not research based.